UNITED STATES PATENT AND TRADEMARK OFFICE

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10/586,123	07/14/2006	Peng Yin	PU040035	3834

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

PTOL-90A (Rev. 04/07)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _14 July 2006_.
2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.
3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-33_ is/are pending in the application.
    4a) Of the above claim(s) _____ is/are withdrawn from consideration.
5)☐ Claim(s) _____ is/are allowed.
6)☒ Claim(s) _1-33_ is/are rejected.
7)☐ Claim(s) _____ is/are objected to.
8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.
10)☒ The drawing(s) filed on _16 July 2010_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.
    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
    a)☐ All   b)☐ Some * c)☐ None of:
      1.☐ Certified copies of the priority documents have been received.
      2.☐ Certified copies of the priority documents have been received in Application No. _____.
      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1.   This application is responsive to application number (10/586123) filed on July 14,

2006. Claims 1-33 are pending and have been examined.

Information Disclosure Statement

2.   Acknowledgement is made of applicant's information disclosure statement.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4.   Claims 1-5, 11-21, and 27-33 rejected under 35 U.S.C. 102(b) as being

anticipated by Shimada (US 2002/0136297).

As per **claim 1**, Shimada discloses a video encoder for encoding image frames

that are divisible into macroblocks, comprising: means for generating a quantization

parameter (QP) estimate for the macroblocks of an image frame; and means for

selection of a frame level QP for the image frame, using one of mean, median, and

mode of QP estimates for the macroblocks (Figure 1 element 14; paragraph [0056] lines 1-6).

As per **claim 2**, Shimada discloses the video encoder as defined in claim 1, wherein the image frames comprise video data in compliance with the International Telecommunication Union, Telecommunication Sector (ITU-T) H.264 standard (paragraph [0004]).

As per **claim 3**, Shimada discloses the video encoder as defined in claim 1, further comprising a macroblock QP calculator in signal communication with said frame level QP selection means for calculating individual macroblock QPs using the selected frame level QP (paragraph [0056] lines 1-10).

As per **claim 4**, Shimada discloses the video encoder as defined in claim 3, wherein said macroblock QP calculator adjusts the individual macroblock QPs based on picture type (paragraph [0056]).

As per **claim 5**, Shimada discloses the video encoder as defined in claim 4, wherein said macroblock QP calculator adjusts the individual macroblock QPs to maintain more details for Intra-coded pictures than for Inter-coded pictures, and to achieve lower mean square errors for the Inter-coded pictures than for the Intra-coded pictures (paragraph [0049] lines 4-8 and 13-16 and [0051]; for an intra-coded picture (I-picture) more code is generated which means more detail is being preserved and further the reasoning behind preserving more detail would be for the purpose of using it for future prediction operation).

As per **claim 11**, Shimada discloses the video encoder as defined in claim 1,

wherein each of the image frames represents a single picture, and the video encoder

further comprises bit allocation means in signal communication with said frame level QP

selection means for allocating more target bits for pictures at a beginning of a Group of

Pictures (GOP) than subsequent pictures in the GOP (paragraph [0052] and [0053]).

As per **claim 12**, Shimada discloses the video encoder as defined in claim 1,

wherein each of the image frames represents a single picture, and the video encoder

further comprises bit allocation means in signal communication with said frame level QP

selection means for limiting a total number of bits allocated to a current Group of

Pictures (GOP) when a previous GOP was coded with a number of bits one of below a

pre-defined minimum threshold and above a predefined maximum threshold (paragraph

[0027]).

As per **claim 13**, Shimada discloses the video encoder as defined in claim 12,

wherein said bit allocation means limits the total number of bits using a linear weighted

allocation scheme (paragraphs [0066] – [0068]).

As per **claim 14**, Shimada discloses the video encoder as defined in claim 12,

wherein said bit allocation means limits the total number of bits based on a virtual buffer

level, the virtual buffer level for simulating a fullness of an actual used buffer and being

constrained in capacity with respect to the actual used buffer (paragraphs [0015] and

[0016]).

As per **claim 15**, Shimada discloses the video encoder as defined in claim 12,

wherein said bit allocation means limits the total number of bits with respect to a

minimum quality and at least one of a buffer safety top margin relating to buffer overflow and a buffer safety bottom margin relating to buffer underflow (paragraphs [0015] and [0016]).

As per **claim 16**, Shimada discloses the video encoder as defined in claim 1, further comprising virtual frame skipping means in signal communication with said frame level QP selection means for virtually skipping a next frame to be encoded when a current buffer level is above a predefined maximum threshold (paragraph [0027]).

Regarding **claim 17**, arguments analogous to those present for claim 1 are applicable for claim 17.

Regarding **claim 18**, arguments analogous to those present for claim 2 are applicable for claim 18.

Regarding **claim 19**, arguments analogous to those present for claim 3 are applicable for claim 19.

Regarding **claim 20**, arguments analogous to those present for claim 4 are applicable for claim 20.

Regarding **claim 21**, arguments analogous to those present for claim 5 are applicable for claim 21.

Regarding **claim 27**, arguments analogous to those present for claim 11 are applicable for claim 27.

Regarding **claim 28**, arguments analogous to those present for claim 12 are applicable for claim 28.

Regarding **claim 29**, arguments analogous to those present for claim 13 are applicable for claim 29.

Regarding **claim 30**, arguments analogous to those present for claim. 14 are applicable for claim 30.

Regarding **claim 31**, arguments analogous to those present for claim 15 are applicable for claim 31.

Regarding **claim 32**, arguments analogous to those present for claim 16 are applicable for claim 32.

Regarding **claim 33**, arguments analogous to those present for claim 1 are applicable for claim 33.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.

4.   Considering objective evidence present in the application indicating obviousness or nonobviousness.

7.   Claims 6-10 and 22-26 rejected under 35 U.S.C. 103(a) as being unpatentable over Shimada (US 2002/0136297) in view of Jung (US 2006/0171454).

As per **claim 6**, Shimada discloses the video encoder as defined in claim 1.

However, Shimada does not explicitly teach further comprising: intra prediction means for intra predicting the macroblocks using a subset of allowable intra prediction modes to form predictions for the macroblocks; and prediction residual calculating means in signal communication with said intra prediction means and with said macroblock QP estimation means for calculating prediction residuals for the predictions, and wherein said macroblock QP estimation means uses at least one of the residuals calculated by said prediction residual calculating means for generating the QP estimate.

In the same field of endeavor, Jung teaches further comprising: intra prediction means for intra predicting the macroblocks using a subset of allowable intra prediction modes to form predictions for the macroblocks; and prediction residual calculating means in signal communication with said intra prediction means and with said macroblock QP estimation means for calculating prediction residuals for the predictions, and wherein said macroblock QP estimation means uses at least one of the residuals calculated by said prediction residual calculating means for generating the QP estimate (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Shimada in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 7**, Shimada discloses the video encoder as defined in claim 6.

However, Shimada does not explicitly teach further comprising mode selection means in signal communication with said prediction residual calculating means for selecting one of the modes in the subset using a mean square error of the prediction residuals.

In the same field of endeavor, Jung teaches further comprising mode selection means in signal communication with said prediction residual calculating means for selecting one of the modes in the subset using a mean square error of the prediction residuals (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Shimada in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 8**, Shimada discloses the video encoder as defined in claim 7.

However, Shimada does not explicitly teach wherein the selected one of the modes in the subset provides a most accurate prediction for a current frame than other ones of the modes in the subset.

In the same field of endeavor, Jung teaches wherein the selected one of the modes in the subset provides a most accurate prediction for a current frame than other ones of the modes in the subset (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Shimada in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 9**, Shimada discloses the video encoder as defined in claim 6.

However, Shimada does not explicitly teach wherein the subset includes three intra prediction modes.

In the same field of endeavor, Jung teaches wherein the subset includes three intra prediction modes (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Shimada in view of Jung. The advantage is providing the best prediction mode for power consumption.

As per **claim 10**, Shimada discloses the video encoder as defined in claim 9.

However, Shimada does not explicitly teach wherein the three intra prediction modes are a vertical intra prediction mode, a horizontal intra prediction mode, and a (DC) intra prediction mode.

In the same field of endeavor, Jung teaches wherein the three intra prediction modes are a vertical intra prediction mode, a horizontal intra prediction mode, and a (DC) intra prediction mode (paragraphs [0033]-[0039]).

Therefore, it would have been obvious for one having ordinary skill in the art at the time of the invention to modify the invention of Shimada in view of Jung. The advantage is providing the best prediction mode for power consumption.

Regarding **claim 22**, arguments analogous to those present for claim 6 are applicable for claim 22.

Regarding **claim 23**, arguments analogous to those present for claim 7 are applicable for claim 23.

Regarding **claim 24**, arguments analogous to those present for claim 8 are applicable for claim 24.

Regarding **claim 25**, arguments analogous to those present for claim 9 are applicable for claim 25.

Regarding **claim 26**, arguments analogous to those present for claim 10 are applicable for claim 26.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHIKAODILI E. ANYIKIRE whose telephone number is (571)270-1445. The examiner can normally be reached on Monday to Friday, 7:30 am to 5 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Marsha D. Banks-Harold can be reached on (571) 272 - 7905. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the

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system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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